Azadirachta excelsa

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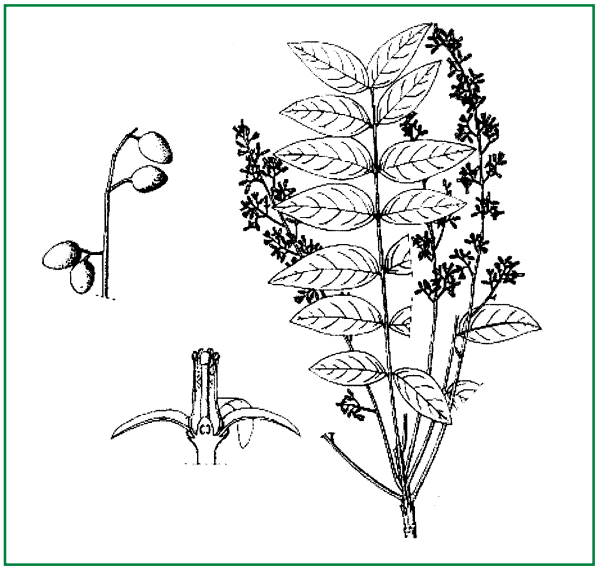
Azadirachta excelsa (Jack) M. Jacobs

Taxonomy and nomenclature

Family: Meliaceae
Synonyms: *Azadirachta integrifolia* Merr., *Azedarach excelsa* (Jack) Kuntze, *Melia excelsa* Jack, *Trichilia excelsa* (Jack) Spreng.
Vernacular/common names: sentang (trade name).

The species is closely related to neem, *Azadirachta indica* A.Juss., which has a more westerly distribution and grows in dryer areas. Intermediate forms (hybrids) are believed to occur where the distribution of the species overlaps. The genus is closely related to *Melia*, in which it was formerly included.



Fruits, flower and flowering branch. From: Plant Resources of South-East Asia No. 5:2.

Distribution and habitat

A lowland humid forest species of SE Asian - Pacific region that mainly grows in old clearings or old secondary forest but also in primary dipterocarp forest. Native to Peninsular Malaysia, Sumatra, Borneo, Sulawesi, the Philippines, the Aru Islands and New Guinea. Widely planted, although rarely outside its native region.

It is found up to about 350 m altitude and best growth is obtained in areas with annual rainfall of more than 2000 mm, mean annual temperature of 22-27°C and with a dry season of no more than 2 – 3 months. It does not tolerate cold or frost.

Requires good quality soil, preferably sandy-loam soils with good drainage and aeration, with pH of 5.0-6.5. Growth rates on level land are better than on slopes or in mountainous areas.

There are no breeding trials or known provenance trials for *A. excelsa*. Current planting material originates almost exclusively from unselected trees.

Uses

Sentang wood is valued for light construction, furniture, panelling and veneer.

The young shoots and flowers are consumed as a vegetable. The tree is commonly planted along roadsides, and farm boundaries or in rubber plantations.

Like neem, the seeds contain azadirachtin, which is used as an insecticide.

In agroforestry, young plantations of *A. excelsa* are used for intercropping with rice, peanuts, mung beans, soybeans and vegetables.

Botanical description

Deciduous tree up to 50 m tall, bole up to 125 cm in diameter, without buttresses. Leaves paripinnately compound, up to 60 (-90) cm long, with 7-11 pairs of leaflets. Leaflets asymmetrical, lanceolate to elliptical, up to 12.5 cm long and 3.5 cm, wide, margin entire (not serrate as in neem). Flowers small greenish-white in up to 70 cm long panicles.

Fruit and seed description

The fruit is a 1-seeded, oblong drupe, 2.5-3.2 cm long with fleshy mesocarp with white latex. Young fruits are green, turning yellow at maturity. The seeds are 20-25 mm long, 10-12 mm wide. There are about 500 pyrenes (seed + endocarp) per kg.

Flowering and fruiting habit

There are great variations in flowering and fruiting time between localities. In north Thailand, the leaves are shed in January-February, and the new leaves emerge immediately thereafter; flowering occurs from February to March. In Thailand, fruits mature between June and July at lower latitudes towards the Malaysian border whereas at higher altitudes they mature earlier, between May and June.

Seed production is normally good and occurs every year.

Harvest

The fruits are harvested when they turn yellow-green. It is important to collect directly from the tree. Seeds collected from the ground have low viability and are prone to fungal attacks.

Processing and handling

After harvest the fruit pulp is removed immediately in a depulper machine or by rubbing the fruits over a wire mesh. Soaking to loosen the fruit pulp should be kept to a minimum as prolonged soaking may affect viability.

Storage and viability

The seed is recalcitrant and can only be stored for a few weeks. A high moisture content (about 50%) should be maintained by storage in open-weaved sacks with or without sawdust. The seed must be protected from desiccation but also given adequate ventilation to prevent heat build-up.

Dormancy and pretreatment

There is no dormancy, but germination may be enhanced by removing the endocarp.

Sowing and germination

Seeds can be sown in seedbeds or directly in polypots or root-trainers.

Spacing in seedbeds is 20 cm between rows and 5 cm within rows. After germination the seedlings require at least 50% shade initially and are gradually exposed to full sunlight when about 30 cm tall. Seedlings can be transferred into large polypots (5 x 8 cm) when two pairs of leaves have developed. In Thailand the recommended potting medium is a mixture of coconut husk and topsoil at a 3:1 ratio, incorporated with a controlled-release fertiliser such as Osmocote at 0.5 g per pot, which is about enough for 3 months or until seedlings are ready for planting out.

Seedlings are normally ready for planting out after 6 months. At least one month before planting out, all seedlings need hardening-off by reducing the water regime and exposing seedlings to full sunlight.

Root cuttings are often used for large scale production. For further details, see Kijkar (1992).

Selected readings

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Agroforestry plot near Kapang Surin Recreational Park, in Trang, Thailand. Photo: Somyos Kijkar.

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